PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ACH58992WO00	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/GB2004/003318	International filing date *(day/month/year)* 30.07.2004	Priority date *(day/month/year)* 30.07.2003
International Patent Classification (IPC) or national classification and IPC A61K9/70, A61K9/06, A61K9/10, A61K9/107, A61K9/12		
Applicant DISPERSE LIMITED et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 4 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☒ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☒	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
27.05.2005	20.12.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Schifferer, H Telephone No. +49 89 2399-7472

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2004/003318

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

   Description, Pages

   1-26 as originally filed

   Claims, Numbers

   1-20 filed with telefax on 03.06.2005

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☒ the claims, Nos. 1-20
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2004/003318

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	-
Inventive step (IS)	Yes:	Claims	-
	No:	Claims	1-19
Industrial applicability (IA)	Yes:	Claims	1-19
	No:	Claims	-

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

V Reasoned statement under Rule 66.2 (a) (ii) with regard to novelty, inventive step or industrial applicability

1) Amendments - Article 19 (2) PCT
The amendments submitted with the telefax of June 3rd, 2005 are not considered acceptable. The original application did mention a content of 2.27% in example 18, but not the range of 0.05-2.27%. It is pointed out that all the other components in said biliquid foam are deemed decisive for present invention.
Therefore, this examination is based on the set of claims as originally submitted.

2) Clarity

2.1) Claim 2 uses the word "about" for defining concentrations. According to PCT International Preliminary Examination Guidelines Chapter III 4.5 a) and Article 6 PCT, this expression lacks clarity, since its exact meaning and range which should indeed be anticipated are left unclear.

3) Documents
The following documents (D1-D5) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1 : US 6 165 479 A (WHEELER DEREK ALFRED) 26 December 2000 (2000-12-26)
D2: WO0162214 (COLOR ACCESS INC) 30 August 2001 (2001-08-30)
D3 : EP 0 487 735 A (SUNSTAR KK) 3 June 1992 (1992-06-03)
D4: WO03/064024 (GUFFOGG PHILIP ERNEST ; DISPERSE LTD (GB); WHEELER DEREK ALFRED) (7 August 2003 (2003-08-07)
D5: WO2004/002436 (CRUTCHLEYNIGEL et al.) 8January 2004 (08.01.2004)

Unless otherwise specified, reference is made to the respective cited passages in D1-D5 (see the International Search Report, Form PCT/ISA/210).

4) Novelty - Article 33 (1) and (2) PCT

4.1) D1 discloses a stable dispersion for a cosmetic or pharmaceutical composition comprising an oil-based biliquid foam and an aqueous gel wherein the oil-based biliquid foam constitutes 1-80 % by weight of the dispersion and said dispersion also includes a surfactant. The aqueous gel as an aqueous fluid may be based on a group consisting of a primary surfactant (alkyl ether sulphate), a coactive surfactant (alkyl betaine), a coactive viscosity modifier (alkyl fatty acid alkanolamide) and a gelling agent (cellulose gum, Carbomer, polyol fatty acid ester). The aqueous phase in general comprises a colloidal polymer or gum suspended in water at a concentration of 0.05-20 %, more preferably 0.2-1 % by weight (alginate gums, guar gum, locust bean gum, xanthane gum, gum acacia, gelatin, hydroxymethylcellulose, hydroxyethyl cellulose, hydroxypropylcellulose, carboxymethylcellulose, bentonites, magnesium aluminum silicates, Carbomers, glyceryl polymethacrylates). In addition, the

aqueous phase may contain water-soluble or water dispersible materials, such as an alcohol (ethanol, propanol), a glycol (propylene glycol), glycerin.
The foam contains mineral oil, an emollient fatty acid ester, silicon oil or other silicone derivatives.

Cosmetic or pharmaceutical compositions are described in D2 which comprise an oil-containing biliquid foam (oil: silicone, cyclomethicone, isoparaffin, vegetable oils, soybean oil, petrolatum constituting 50-90 % or more preferably 70-90 % by weight of the foam). Water and surfactants (anionic, cationic, amphoteric) are dispersed in the salt-containing aqueous phase. The gellants (0.01-10%, 1-5%) used for stabilization of the dispersion include: gums, Carbomer, glyceryl polymethacrylate. Since the compositions are to be used for skin care products, antibiotics, anti-viral agents, anti-inflammatory agents are contained.

With example 11 of D3, an emulsified hair cosmetic (hair mousse) is described which comprises a dimethylsilicone rubber (0.3 parts), a dimethylsilicone oil (4 parts), a polyhydric alcohol (propylene glycol, butylene glycol, glycerin, 1 part) and a surfactant (polyoxyethylene oleyl ether). The alcohol reaches approximately 16 % by weight with reference to the total continuous polar liquid phase.

4.2) In the light of D1-D3 (see sections V-3, 4.1) and under consideration of section V-1./2.1, the subject-matter of claims 1-19 seems to be novel according to Article 33 (1) and (2) PCT, since said compositions do not disclose a percentage of at least 65 % by weight of a C1-C4 alcohol, polyethylene glycol, ethylene glycol or propylene glycol and since the explicit use of the castor oil/poly(alkylene glycol) adduct as surfactant is missing.

5) Inventive Step - Article 33 (1) and (3) PCT

5.1) The problem posed in the present application was the creation of topical oil-based products with a high level of alcohol for cosmetic and pharmaceutical use.

The solution according to the Applicant was a) a biliquid foam comprising a non-polar liquid other than a fuel, a polar liquid (polyethylene glycol, ethylene glycol, propylene glycol, C1-C4 alcohol) and a surfactant (castor oil/poly(alkylene glycol) adducts) and b) a stable dispersion based on this foam and an aqueous gel comprising a colloidal polymer or gum and an active agent.

D1 which is regarded closest prior art discloses a stable dispersion for a cosmetic or pharmaceutical composition comprising an oil-based biliquid foam and an aqueous gel wherein the oil-based biliquid foam constitutes 1-80 % by weight of the dispersion and said dispersion also includes a surfactant. The aqueous phase in general comprises a colloidal polymer or gum suspended in water at a concentration of 0.05-20 %, more preferably 0.2-1 % by weight (alginate gums, guar gum, locust bean gum, xanthane gum, gum acacia, gelatin, hydroxymethylcellulose, hydroxyethyl cellulose, hydroxypropylcellulose, carboxymethylcellulose, bentonites, magnesium aluminum silicates, Carbomers, glyceryl polymethacrylates). In addition, the aqueous phase may contain water-soluble or water dispersible materials, such as an alcohol (ethanol, propanol), a glycol (propylene glycol), glycerin. The foam contains mineral oil, an emollient fatty acid ester, silicon oil or other silicone derivatives.

D1 does not disclose
a) the use of castor oil/poly(alkylene glycol) adducts as a surfactant
b) a percentage of at least 65 % by weight of C1-C4 alcohols, polyethylene glycol, ethylene glycol relative to the weight of the continuous polar phase.

D3 discloses an emulsified hair foam with polyoxyethylene oleyl ether as surfactant and an increased content of a polyhydric alcohol (propylene glycol, butylene glycol, glycerin) which is approximately 16 % of the continuous phase.

It appears to be obvious to a person skilled in the art to combine D1 and D2 for suitable compositions where the percentage of polyhydric alcohol is increased and can - based on the experience of D3 - be further increased and where an alternative of a surfactant is chosen to solve the problem of an increased alcohol content in pharmaceutical and cosmetical formulations with acceptable local tolerance.

Unexpected or surprising effects do not seem to be connected with the inclusion of said surfactants and with the increase in the alcohol content from 16 % to more than 65 % in the continuous layer in comparison to the prior art.

5.2) Therefore, under provision of V-1./2.1., the subject-matter of claims 1-19 is obvious to a person skilled in the art due to the combination of D1 and D2 as well as due to general textbook knowledge. Thus the aforementioned subject-matter does not meet the requirements of Article 33 (1) and (3) PCT in that extent that it cannot be considered inventive.

VI Certain documents cited
On the basis of rule 70.10 PCT certain published documents - namely those published after filing /priority date of present application (Rule 64 (3) PCT) - should be mentioned as such. This refers to D4 and D5 demonstrating the following details:

a) D4

Application No: PCT/GB03/00421
Patent No: WO03/064024
Publication date: 07.08.2003
Filing date: 31.01.2003
Priority date: 31.01.2002

D4 discloses a biliquid foam comprising a) a non-polar phase (cyclomethicone, dimethicone, vegetable oil, mineral oil, petroleum), b) a continuous phase comprising water in admixture with another polar liquid (C1-C3 alcohol, C4 alcohol with two hydroxy groups, ethylene glycol) and c) a surfactant (polyoxyethylene oleyl ether, Etocas 25 which corresponds to castor oil/polyethylene glycol adduct). In cases of using petroleum derivatives for the non-polar phase, 50-99% of the C1-C4 alcohol or ethylene glycol are included in the foam. It has to be taken into consideration that mineral oil (also called liquid

petrolatum) listed in claim 6 of present application may also refer to petroleum jelly, a synonym for petrolatum or vaseline. The use of a higher percentage of alcohol and ethylene glycol in the continuous phase thus seems to be indirectly derivable also for cosmetic and pharmaceutical foams.

b) D5

Application No: PCT/GB2003/002713
Patent No: WO2004/002436
Publication date: 08.01.2004
Filing date: 24.06.2003
Priority date: 26.06.2002

D5 describes a biliquid foam comprising a substantially water immiscible internal oil phase (cyclomethicone, dimethicone isopropyl isostearate, lanolate, soybean oil, oleyl alcohol), a surfactant (such as PEG 25 castor oil) and a continuous phase. It is generally based on an aqueous phase which includes a substantial level of C1-C4 alcohol, or ethylene glycol. The foam is entrapped in polymeric material (cellulose derivatives, gums).
D4 and D5 seem to render claims 1-8 not novel when evaluated under the regulations of the EPC.

WE CLAIM:

1. A biliquid foam comprising from 10% to 98% by weight of a non-polar liquid other than a fuel and from 2 to 88% by weight of a continuous phase polar liquid comprising a C_1-C_4 alcohol, a liquid polyethylene glycol, ethylene glycol or propylene glycol, or mixtures thereof, in an amount of at least 65% by weight, relative to the weight of the continuous phase, wherein the biliquid foam is stabilized with an amount of from 0.05% to 2.27% by weight based on the total formulation of a surfactant which is selected from castor oil/poly(alkylene glycol) adducts containing from 20 to 50 alkoxy groups, a C_8-C_{24} fatty acid or hydrogenated castor oil/poly(alkylene glycol) adducts containing from 20 to 60 alkoxy groups, or mixtures thereof.

2. A biliquid foam as claimed in claim 1 wherein the amount of surfactant is from 0.05 to 2% by weight based on the total formulation.

3. A biliquid foam as claimed in claim 1 wherein the amount of surfactant is 1% by weight based on the total formulation.

4. A biliquid foam as claimed in any one of the preceding claims wherein the surfactant comprises a hydrogenated castor oil/polyethylene glycol adduct containing from 40 to 60 ethoxy groups.

5. A biliquid foam as claimed in any one of claims 1 to 3 wherein the surfactant comprises a castor oil/poly(alkylene glycol) adduct containing 25 to 45 ethoxy groups.

6. A biliquid foam as claimed in any one of the preceding claims wherein the polar liquid is aqueous and comprises from 70% to 99% by weight of the C_1-C_4 alcohol, liquid polyethylene glycol, ethylene glycol or propylene glycol, or mixtures thereof.

7. A biliquid foam as claimed in any one of claims 1 to 3 wherein the non-polar liquid comprises a mineral oil, a siloxane, an emollient ester, a glyceride, a lanolin oil, a natural oil, oleyl alcohol, isoeicosane or isooctahexacontane, or mixtures thereof.

8. A biliquid foam as claimed in claim 7 wherein the siloxane comprises dimethicone, cyclomethicone, dimethiconol, dimethicone copolyol, octamethylcyclotetrasiloxane, octamethylcyclo-pentasiloxane, decamethylcyclopentasiloxane, or mixtures thereof.

9. A biliquid foam as claimed in claim 7 wherein the emollient ester is isopropyl isostearate, lanolate, myristate or palmitate, or octyl palmitate, or mixtures thereof.

10. A stable dispersion having a content of C_1-C_4 alcohol, a liquid polyethylene glycol, ethylene glycol or propylene glycol, or mixtures thereof, of at least 65% by weight, which dispersion comprises from 1 to 80% by weight of a biliquid foam as claimed in any one of the preceding claims and from 99 to 20% by weight of an aqueous gel.

11. A stable dispersion as claimed in claim 10 wherein the aqueous gel constitutes from 50 to 99% by weight thereof.

12. A stable dispersion as claimed in claim 10 wherein the aqueous gel comprises a colloidal polymer or gum suspended in water.

13. A stable dispersion as claimed in any one of claims 10 to 12 which includes therein at least one pharmaceutical or cosmetic compound therein.

14. A process for preparing a stable dispersion which comprises from 1 to 80% by weight of a biliquid foam as claimed in any one of claims 1 to 9 and from 99 to 20% by weight of an aqueous gel, which process mixing together the biliquid foam and the aqueous gel.

15. A process as claimed in claim 14 wherein the stable dispersion also comprises a pharmaceutical compound.

16. A process as claimed in claim 15 in which the stable dispersion is in a topical form for application to the skin and contains a non-steroidal anti-flammatory drug, an anti-acne compound, anti-viral or anti bacterial compound.

17. A process as claimed in claim 16 in which the stable dispersion is in the form of a transdermal delivery device or in a cream or gel preparation and which contains nicotine, estradiol, nitroglycerin, testosterone or scopolamine as the active ingredient.

18. A process as claimed in claim 14 wherein the stable dispersion also comprises a cosmetic compound.

19. A process as claimed in claim 18 in which the stable dispersion is an anti-cellulite cream or an aftershave lotion.

20. A process as claimed in claim 14 wherein the stable dispersion also comprises a disinfectant compound.